PAPERS DELIVERED AT STATED MEETINGS

THE PATHOLOGY AND NEUROLOGIC SYMPTOMS IN PERNICIOUS ANEMIA

(Abstract)

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The pathologic process which is observed in the central nervous system in cases of pernicious anemia is a degenerative one. It consists essentially in a demyelinization of nerve fibers associated with or resulting in a breaking down of the axones. The process commences in small foci which later coalesce, and results in secondary degeneration of the fiber tracts. The first site of the process is usually either the lumbo-sacral segments or the upper cervical segments of the cord. Later on the middle cervical and dorsal segments are affected. The posterior columns and lateral columns of the cord are most affected. The direct cerebellar tract is likewise involved. It is rare that the gray matter in the cord shows any material affection.

Pathologic changes have been found in the brain. They consist of areas of rarification, foci demyelinization, and of slight changes in the ganglion cells. They are not as extensive or as pronounced as are the changes in the spinal cord. These changes are believed to be due to the influence of some toxin which makes itself felt through the circulation. They are not secondary to changes in blood vessels. It is unknown why the process selects the region of the cord above mentioned so exclusively.

Pernicious anemia is not the only disease in which this pathologic process occurs. It is found in other anemias, which are classified as secondary. It also occurs in the anemia produced by *Bothriocephalus latus*. Occasionally severe and prolonged cachectic states due to carcinoma produce the above changes. They have also been described in leukemia, although here the leukemic infiltration of the blood-vessels may be a factor in their production. It is not infrequently found in diabetes. It has been

described in cases of chronic alcoholism and has been observed in pellagra. Therefore neither the process nor the symptoms arising can be regarded as diagnostic of pernicious anemia.

The neurologic symptoms are such as would be expected from interference in function of the parts involved:

I. Posterior Column Symptoms:
   1. Atony.
   2. Loss or diminution of tendon reflexes.
   3. Ataxia.
   4. Disturbance in vibratory and joint sense.
   5. Parasthesiae.
   6. Girdle sensation.
   7. Bladder.

II. Lateral Column Symptoms:
   1. Increased tonus—spasticity.
   2. Increased reflexes.
   3. Pathologic reflexes (*a*) Babinski.
      (*b*) Clonus.
      (*c*) Loss of abdominal reflexes.
   4. Motor weakness—paralysis.

III. Posterior and Lateral Column Symptoms:

Depends upon the level at which they are most affected, the time in the process when they are involved and the extent of their affection.

Example:

1. Spastic—ataxic paraplegia.
   Clinical picture of pyramidal tract plus ataxia.
2. Tabes syndrome plus motor weakness rigidity plus pathological reflexes of pyramidal tract (Babinski-clonus).

Early symptoms are usually parasthesiae in the extremities and the tongue, ataxia of the lower extremities and disturbance of vibratory sensibility. The symptoms may antedate the appearance of the typical blood picture of pernicious anemia for a period extending from months to years. There may be remissions of symptoms in the early stages. The weakness in the extremities is very frequently a pronounced symptom. This may go on to a paresis which compels the patient to be bedridden. Under treatment this weakness may improve considerably. When, however, the degenerative process in the spinal cord is far advanced, there will be no change in the objective neurologic symptoms even

though the blood shows only slight changes. The same is true in regard to those cases where the condition of the blood has been improved by treatment. Minor and Murphy, in a recent article on the influence of liver diet, showed that the blood had become normal and that the neurologic symptoms had not improved. It is said that the neurologic symptoms occur in from 50 per cent. to 75 per cent. of the cases. They are very frequently overlooked because the physician is not on his guard to detect their early appearance or is not familiar with the technique of neurological examination. Occasionally no neurologic symptoms have been observed and yet microscopic examination of the cord has shown that the changes are present.

Mental symptoms in pernicious anemia occur occasionally, and the clinical picture is said by some to be characteristic of the disease. They are, however, not of frequent occurrence.

COMMENT ON TROPICAL DISEASES OF INTEREST IN NEW YORK CITY—A BRIEF REVIEW

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Diagnosis, under all circumstances, is admittedly a difficult art, and the practitioner in the City of New York cannot well afford to dismiss from all consideration the entire list of diseases which are called tropical because he may deem them foreign to his practical interest.

"Tropical diseases" is a more or less elastic term. It does not imply diseases which are strictly peculiar to the tropics, nor could it possibly mean all diseases which prevail in the tropics. Few diseases are strictly confined to tropical latitudes, and the practitioner in the tropics in his daily life finds himself confronted for the most part with problems very similar to those which confront the practitioner in more temperate latitudes.

The term in general is taken to include those diseases which from one circumstance or another are especially prevalent in warm climates.